

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A communication network designing circuit for multiple point communication service for permitting arbitrary communication within a predetermined range by providing a traffic ~~amount of data inflowing~~ flowing in from an ingress node through which data flows in from an other network and a traffic ~~amount of data~~ flowing out from an egress node through which data is fed to the other network, ~~in an object network consisted of a plurality of nodes and connected to other network~~, comprising:

setting means for setting a mathematical programming problem for deriving said multiple point communication service to permit arbitrary communication within the predetermined range;
and

optimizing means for solving the mathematical programming problem set by said setting means and obtaining a path for said multiple point communication service.

2. (Currently Amended) [[A]] The communication network designing circuit as set forth in claim 1, wherein said path for said multiple point communication service is derived on the basis of a preliminarily set optimization standard.

3. (Currently Amended) [[A]] The communication network designing circuit as set forth in claim 1, wherein said setting means comprises:

optimization reference generating means for setting an objective function for minimizing a link load in ~~said~~ an object network coupled to the other network and serving as an optimization reference and setting a constraint expression for deriving said link load;

route selecting condition generating means for generating a constraint expression for selecting a route for including traffic ~~of data inflowing~~ flowing in from the other network;

per-user necessary link capacity calculating condition generating means for generating a constraint expression for calculating a necessary link bandwidth for each link carrying traffic flowing in ~~band of each link per traffic of data inflowing~~ from each ingress node; and

link including condition generating means for generating a constraint expression so as not to exceed a link capacity limit in each link.

4. (Currently Amended) ~~[[A]]~~ The communication network designing circuit as set forth in claim 3, wherein the optimization reference generating means, the route selecting condition generating means, the per-user necessary link capacity calculating condition generating means, and the link including condition generating means ~~each means in said setting means performs on process~~ operate in parallel ~~relative~~ with respect to each other.

5. (Currently Amended) A communication network designing method for multiple point communication service for permitting arbitrary communication within a predetermined range by providing ~~a traffic amount of data inflowing~~ traffic flowing in from an ingress node through which data flows in from an other network and a traffic ~~amount of data~~ flowing out from an egress node through which data is fed to the other network, ~~in an object network consisted of a~~

~~plurality of nodes and connected to other network~~, comprising:

~~setting step of~~ setting a mathematical programming problem for deriving said multiple point communication service to provide arbitrary communication within the predetermined range; and

~~optimizing step of~~ solving the mathematical programming problem set ~~in~~ by said setting;
~~step and~~

obtaining a path for said multiple point communication service.

6. (Currently Amended) ~~[[A]]~~ The communication network designing method as set forth in claim 5, wherein said path for said multiple point communication service is derived on the basis of a preliminarily set optimization standard.

7. (Currently Amended) ~~[[A]]~~ The communication network designing method as set forth in claim 5, wherein said setting ~~step~~ comprises:

~~optimization reference generating step of~~ setting an objective function for minimizing a link load in said an object network operatively coupled to the other network and where the objective function serves ~~serving~~ as an optimization reference; ~~and~~

setting a constraint expression for deriving said link load;

~~route selecting condition generating step of~~ generating a constraint expression for selecting a route for including traffic ~~of data~~ ng flowing in from the other network;

~~per ser necessary link capacity calculating condition generating step of~~ generating a constraint expression for calculating a necessary link bandwidth of each link ~~per traffic of data~~

~~inflowing~~ carrying traffic flowing in from each ingress node; and

~~link including condition generating step~~ of generating a constraint expression so as not to exceed a link capacity limit in each link.

8. (Currently Amended) [[A]] The communication network designing method as set forth in claim 7, wherein each sub step in said setting step performs on process the setting an objective function, the setting a constraint expression, the generating a constraint expression for selecting, the generating a constraint expression for calculating, and the generating a constraint expression so as not to exceed a link capacity limit in each link operate in parallel relative with respect to each other.

9. (Currently Amended) A storage medium storing a communication network design control program for designing a communication network for multiple point communication service for permitting arbitrary communication within a predetermined range by providing a traffic amount of data ~~inflowing~~ flowing in from an ingress node through which data flows in from an other network and a traffic amount of data flowing out from an egress node through which data is fed to the other network, ~~in an object network consisted of a plurality of nodes and connected to other network,~~ said communication network design control program comprising:

~~setting step of operating a computer for~~ setting a mathematical programming problem for deriving said multiple point communication service to provide arbitrary communication within the predetermined range; and

~~optimizing step of operating said computer for~~ solving the mathematical programming

problem set in said setting step; and

obtaining a path for said multiple point communication service.

10. (Currently Amended) ~~[[A]]~~ The storage medium as set forth in claim 9, further comprising:

~~wherein said communication network design control program operates said computer for~~

deriving said path for said multiple point communication service on the basis of a
preliminarily set optimization standard.

11. (Currently Amended) ~~[[A]]~~ The storage medium as set forth in claim 9, wherein said setting

~~step in said communication network design control program~~ further comprises:

~~optimization reference generating step of operating said computer for setting an objective~~
~~function for minimizing a link load in said object network and serving in cooperation with an~~
objective function that serves as an optimization reference; and

setting a constraint expression for deriving said link load;

~~route selecting condition generating step of operating said computer for generating a~~
constraint expression for selecting a route for including traffic of ~~data-inflowing~~ flowing in from
the other network;

~~per-ser necessary link capacity calculating condition generating step of operating said~~
~~computer for generating a constraint expression for calculating a necessary link bandwidth of~~
each link ~~per~~ carrying traffic of ~~data-inflowing~~ flowing in from each ingress node; and

~~link including condition generating step of operating said computer for generating a~~
constraint expression so as not to exceed a link capacity limit in each link.

12. (Currently Amended) [[A]] The storage medium as set forth in claim 11, wherein each sub-step in said setting step performs on process the minimizing a link load, the setting a constraint expression, the generating a constraint expression for selecting a route, the generating a constraint expression for calculating a necessary link bandwidth, and the generating a constraint expression operate in parallel relative with respect to each other.

13. (Currently Amended) A transmission medium transmitting a communication network design control program for designing a communication network for multiple point communication service for permitting arbitrary communication within a predetermined range by providing a traffic ~~amount of data inflowing~~ flowing in from an ingress node through which data flows in from an other network and a traffic ~~amount of data flowing~~ flows out from an egress node through which data is fed to the other network, ~~in an object network consisted of a plurality of nodes and connected to other network,~~ said communication network design control program comprising:

~~setting step of operating a computer for~~ setting a mathematical programming problem for deriving said multiple point communication service to provide arbitrary communication within the predetermined range; and

~~optimizing step of operating said computer for~~ solving the mathematical programming problem set in said setting step; and

obtaining a path for said multiple point communication service.

14. (Currently Amended) ~~[[A]]~~ The transmission medium as set forth in claim 13, wherein said communication network design control program operates said computer for ~~deriving~~ obtaining said path for said multiple point communication service on the basis of a preliminarily set optimization standard.

15. (Currently Amended) ~~[[A]]~~ The transmission medium as set forth in claim 13, wherein said setting step in said communication network design control program comprises:

~~optimization reference generating step of operating said computer for setting an objective function for minimizing a link load in said an object network and serving as an optimization reference; and~~

setting a constraint expression for deriving said link load;

~~route selecting condition generating step of operating said computer for generating a constraint expression for selecting a route for including traffic of data leaving flowing in from the other network;~~

~~per ser necessary link capacity calculating condition generating step of operating said computer for generating a constraint expression for calculating a necessary link bandwidth of each link per carrying traffic of data inflowing flowing in from each ingress node; and~~

~~link including condition generating step of operating said computer for generating a constraint expression so as not to exceed a link capacity limit in each link.~~

16. (Currently Amended) ~~[[A]]~~ The transmission medium as set forth in claim 15, wherein the setting an objective function, the generating a constraint expression, the operating said computer

for generating a constraint expression for calculating a necessary link bandwidth, and the
operating said computer for generating a constraint expression so as not to exceed a link capacity
limit in each link ~~each sub step in said setting step performs on process operate~~ in parallel
~~relative~~ with respect to each other.